

The Nature Conservancy, the University of Alaska Anchorage - Department of Health Sciences and the U.S. Fish & Wildlife Service Conservation Planning Assistance Program

Present

Impacts of Metals and Metallic Mining on Aquatic Ecosystems and Human Health

A three day seminar facilitated by Dr. Frances Solomon from the University of British Columbia and Dr. Elizabeth Hodges Snyder from the University of Alaska, Anchorage

Dates: November 30, December 1 and 2, 2010

Location: University of Alaska Anchorage, Room TBA

Course Description and Objectives

The purpose of this course is to encourage environmentally-sensitive mining practices by educating mining engineers and environmental professionals about impacts of metals on fish, other aquatic species, and human health. A related objective is to promote collaboration between engineers and scientists with respect to prospecting, design, development, permitting, operation, and closure of mines to reduce discharge of metals to the aquatic environment.

This course is an overview of metals and related “semi-metals” (aluminum, arsenic, cadmium, chromium, copper, gold, lead, manganese, mercury, nickel, selenium, silver, tin, uranium, and zinc) that are mined or emitted as by-products of mining. The course begins with a description of the properties of metals and how mining and other human activities can discharge metals and acid rock drainage (ARD) to aquatic ecosystems. The course will also focus on principles of metal toxicity, exposure pathways, factors affecting metal toxicity, and impacts of each metal on aquatic organisms and human health. There will be a discussion of toxicity testing methods, and source control and remediation of metal contamination and ARD at mine sites.

Background

Environmentally-sensitive mining practices involve designing, constructing, operating, closing, and monitoring mines in a manner that meets the environmental, economic, and social needs of present and future generations. In recent years, there has been increased awareness of the need to extract metals in a more environmentally-sensitive manner than has been the case in the past and increased understanding that preventing the discharge of metals and ARD costs less than cleaning up a contaminated site. As knowledge has increased about the toxic impacts of metals that are mined or emitted as by-products of mining, permitting regulations for proposed mines and water quality regulations for protection of aquatic life and human health have become stricter. This course is intended to help mining industry and environmental professionals to perform their work in concordance with 21st century knowledge and requirements while continuing a vital metal extraction industry.

Dr. Frances Solomon

Dr. Frances Solomon is an environmental biologist with a bachelor's degree in biology and minor in chemistry from the University of Rochester (Rochester, NY), and a Master's degree in environmental health and Ph.D. in fisheries from the University of Washington (Seattle, WA). She has more than 25 years of professional experience in environmental agencies, addressing the biological impacts of toxic water pollutants, pollution prevention and control, and protection and restoration of salmon habitat.

Dr. Solomon is passionate about bringing her work experience and knowledge to the classroom. She taught “Impacts of Metals on Aquatic Ecosystems and Human Health” at the University of British Columbia (UBC), currently teaches two-day and three-day versions of this course through the UBC Mining Studies Institute and Edumine (www.edumine.com), and has developed an online version for EduMine. She also teaches short courses on “Impacts of Metals and Toxic Organic Chemicals on Aquatic Ecosystems and Human Health” to environmental professionals in Washington State and western Canada. Dr. Solomon teaches “Environmental Pollution” at Western Washington University, Huxley College of the Environment on the Peninsulas, and has taught other environmental science courses at Northwest University in Xi’an, China, University of Washington Tacoma, Western Washington University, and the Evergreen State College Tacoma. Starting in 2006, she has participated every summer in teaching “Humans in the Environment,” a three-week course at University of Washington Seattle for students from Keio University (Tokyo, Japan).

She is Vice-President of the Pacific Northwest region of the Society of Environmental Toxicology and Chemistry, a Past-President of the Washington section of the American Water Resources Association, and a Past-President and long-time Board member of the Seattle chapter of the Association for Women in Science. Outside of professional and mentoring activities, she is an enthusiastic hiker, bicyclist, and international traveler.

Dr. Elizabeth Hodges Snyder

Dr. Snyder is a soil scientist and environmental health professional. She earned her Master’s degree in Global Environmental Health from Emory University (Atlanta, GA) and her Ph.D. in Soil and Water Science from the University of Florida (Gainesville, FL). Her training and research focuses on the fate, transport, and human/ecological health risks of environmental contaminants. Dr. Snyder is currently an Assistant Professor of Public Health in the Department of Health Sciences at the University of Alaska Anchorage. Here she teaches courses in Environmental and Occupational Health, Research Tools and Methods, and Soil, Water, and Public Health.